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all parts, the highest of which is Mavégani mountain, which is situated 7 miles from the southern extremity of the island ; it has two peaks close together, of which the westernmost is the highest, being, according to the French Survey, 2164 feet above the sea. The most remarkable mountain is Uchongui, a sugarloaf-peak, which rises at less than 3 miles from the southern extreme of the island, and is said to be 2105 feet above the sea.

Mayotta is said to contain about 8000 inhabitants, of a race similar to the other Comoro islanders. It is now a French colony, a small military and naval establishment, having been formed at Zaudzi some years ago. The island is capable of cultivation in most parts : eight sugar-estates on the eastern side are worked with profit, although labour is in great demand.

In 1855 there was no cultivation on the western side of the island, but roads were being made to it.

Zaudzi Island, in lat. $12^{\circ} 46' 48''$ s., long. $45^{\circ} 20' 14''$ E., lies to the westward of, and is connected with, Pamauzi Island by a neck of sand, on which a causeway has been constructed. These two islands lie inside the chain of reefs on the east side of Mayotta. At the north-east extreme of Pamauzi there is a lake, apparently the crater of an extinct volcano.

The French establishment is on the island of Zaudzi, and consists of a governor, colonial officers, some artificers and seamen, and about 100 soldiers, besides a few native ones. There are several substantial government-buildings and storehouses, and numerous huts. A supply of provisions and coal is kept here for the troops, and for the French cruisers on this station. The water on Zaudzi is scarce and not good ; the establishment is supplied from the main island.

The climate of Mayotta has the reputation of being very unhealthy ; the shores of the main island are lined in places with mangrove-swamps, which uncover at low water, and are productive of malaria and fever. In this respect, as well as in others, Mayotta differs from the other Comoro Islands, which are generally considered healthy.

XIX.—*Some Account of the Physical Geography of Newfoundland.*

By JULIAN MORETON, Colonial Chaplain, Labuan.

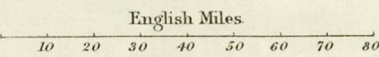
THIS country presents a nearly plane surface of heaths, fens, and ponds, with some ranges of hills rather than mountains near the coasts, which are much higher in the south and west than on the eastern side of the island. The highest headlands to the westward are about 1100 or 1200 feet. On the east coast they are lower :





Map of
NEWFOUNDLAND

to accompany the Paper
by the Rev. J. Moreton.





Map of NEWFOUNDLAND

to accompany the Paper
by the Rev^d J. Moreton.

English Miles

10 20 30 40 50 60 70 80



300 feet is about their average height. Ponds or lakes and small brooks are numerous among the hills, and the scenery is beautiful, but not grand. There are but two streams deserving the name of river; they are the Great and Little Codroy Rivers; the former navigable for 15 miles, the latter for only 6 miles, from the mouth upward. Large rocks in the channel impede the passage of any craft larger than a two-handed flat in almost all the other streams. One large lake named Ocean or Grand Pond, an island in which is reputed to have been the last retreat of the now extirpated Red Indians, is situate in the interior country, not far from the head of the Bay of Islands. A gentleman who crossed part of the country in 1853, entering at St. George's Bay and emerging at Hall's Inlet, spoke of large lakes upon which he performed great part of his journey, he having a boat with him. One of these lakes was nearly 40 miles long. From the course the traveller took, this largest lake must be the Ocean Pond; and his account agrees with and confirms that which I received from an old furrier, from whom I learned many particulars of the country. In the eastern part there are some very large ponds, which are reported by the fur-hunters to be all connected by brooks. These ponds are Gander Bay Pond, Upper and Lower Gambo, Upper and Lower Mackrell Ponds, and Clode Sound Water. Upon the Gambo and Mackrell Ponds I have travelled. The Gambos are two sheets of water, 18 miles in their united length, connected by a brook. The two Mackrell Ponds are very similar to the Gambos in form and size, but lie further inland, the Lower Mackrell being parallel with the Upper Gambo. Fur-collectors frequent the shores of these ponds, and are almost the only persons, beside the Micmac Indians, who really know anything of the interior. From these persons I learned that the country within was similar in character to a part which I traversed a few miles inside Cape Freels. Towards this cape the hills decline, the country becomes for a space of many miles very low and level, and there is a large break in the line of forest. The whole plain is swamp and heath, with frequent spots of bare granite rock protruding, and here and there a small grove, or, as the country people term it, "droke," of very stunted, blight-stricken fir-trees, none of them of larger growth than firewood. In 1851 some Indians crossed the island from Bay Despair to Freshwater Bay. They were 9 days in the interior, having stayed by the way to kill and eat venison, and spent time in the desultory way which is usual with their race. It was reckoned that they might have come across in 6 days. From this I judge that the character of the country does not present much difficulty in the journey. An old furrier, who had spent years in fur-collecting about the country between White Bay and Bay of Islands, told me when I was intending a journey thither, that I

might travel from the head of White Bay without difficulty the whole distance in 3 days; and this supports the same conclusion. All that I have learned disposes me to believe that the central parts generally resemble the open lands near Cape Freels.

There is very much bare protruding rock in all parts of the island, presenting everywhere a rounded, worn, and water-washed appearance, such as could be produced only by their having once been part of the bed of ocean. Large boulders, of stone of different character from all the rock around, are lodged in all parts; some of the most remarkable are upon the highest lands. A recent, and I suppose still proceeding, uprising of the whole island from the sea is very observable, and many proofs of it have been brought to my notice. For instance, a narrow tickle at the head of Greenspond Harbour, in which the water now is scarcely deep enough for a punt's passing, was, in the memory of aged people, sufficient for the passage of large fishing-boats called Shallops. At Pinchard's or Pilchard's Island, and in Twillingate Harbour, rocks now above water are remembered as formerly sunken rocks, over which it was possible and usual to row small boats. In many places, from the same cause, the fishermen cannot now let their boats ride in the same water where their fathers were wont to moor them. I have been told of similar changes in Trinity Harbour. The prevalent kind of rock is a very dense grey granite, but there is upon an island in Conception Bay a quarry of very fine freestone. Copper, iron, and lead are known to exist in many places; generally in quantities too small to pay for working, though in one part to the westward some good success has been obtained in mining for both copper and iron. Manganese ore was found near the same place, but so impure that it would not pay for working. During the last five or six years diligent search for minerals has been made in the east and north-east, by competent persons and at much expense. Specimens have been shown of metals found; but the only real success, the only discovery at least which was followed up by a mining adventure, was a large vein of lead, of very pure quality, in Bay Bulls Arm, Trinity Bay, which was worked in 1860-1, very profitably I believe, by some American capitalists. In the midst of success the work was suddenly ended by, it was said, a failure of the metal: the vein was reported to be lost, and no great search seems to have been made for a further discovery. In Indian Bay there is a warm spring; and in Fresh-water Bay I have seen in a pond two springs which always defy the frost, and keep, over each of them throughout the winter, a circular open space, while all the other surface of the pond is coated with very thick ice.

The soil is generally poor and nearly unproductive. In many of the inhabited places, especially on the north-east coast, the only

soil is peat, often not more than one foot deep upon the surface of the rock. A few miles within the shore, however, there is a poor, yellow gravel beneath the turf; and in some few places a substratum of clay. With this clay brick-making has been attempted, but not very successfully. Whether the want of success were due to the unsuitableness of the clay, or to want of skill, I cannot say. On the western shore near the Codroy Rivers, I have seen good red marl of many feet depth, and some gypsum.

Great heat and extreme cold are both frequent in Newfoundland. I have noted the thermometer at 136° in the sun, when probably the height in the shade would be 97° ; and this, though greater than the usual extreme, was not very infrequent. At the place of my abode, near the centre of the east coast, the winter is seldom known in which the mercury does not sometimes descend to 8° below zero, and I have known it to reach 22° . It is commonly said in Newfoundland, and the remark is near the truth, that the summer is but a three months' season, and all the remaining nine months are winter. Sudden, great, and trying changes of temperature are experienced at all seasons. In summer the western winds, blowing overland, bring extreme heat; but usually, on fine days, unless the land-breeze is strong, the wind veers southward, and before evening brings in fog from the sea; often making fire and additional clothing grateful in the evening of the same day in which the dry heat has been scarcely sufferable. In winter the land-breezes blowing over a great extent of snow-clad country are most severely cold, while those from the sea are mild and damp. With a shift of wind it is not an infrequent thing for the mercury in one night to rise from some degrees below zero to 30° or more above. The cold always becomes many degrees more intense for a few hours before the coming in of a mild wind from sea; the frosty air being repelled, and returned in a dense state upon the land, by the force of the new-coming breeze. The same winds, namely, those from any quarter between south-west and north, bring in summer the greatest heat and in winter the severest cold. For these winds pass over a great extent of land, which is either greatly heated or snow-clad according to the season. A similar remark is correct of the winds from north to south-west inclusive; they are in winter the mildest, and in summer the coldest, because of the fog which they always bring to the shore. An exception may be made to this latter remark, because in March, April, and May, when the Arctic ice is driving southward by the coast, the sea-breezes pass to the land over so vast an extent of frozen water, and cause a biting coldness of the air. But even at these seasons the fog commonly prevails and the atmosphere is damp. Connected with these observations is the fact, that some winters which are very severe in the south of Newfoundland are mild seasons in the north. In those

winters the prevailing winds are from north and north-east, which come *from sea* to the north and eastward shores, and pass *overland* to the south parts of the island. By similar reasoning the fact is accounted for that the winters which are mild in the south are severe in the north, the prevailing winds coming then from opposite quarters. The great fog-banks, which seem perpetual at sea, are much more frequent in their visits to the shore of the south than of other parts: a fact which I venture to take in confirmation of the theory that these fogs are generated in the sea south of Newfoundland by the meeting of the Arctic currents and the Gulf Stream. In a small book lately published I have noted, as one principal reason of the severity of climate, the fact that two vast streams of Arctic water, the Davis Straits and East Greenland currents, combine and run by the shores of Newfoundland, and repel the Gulf Stream. Proximity to the vast Canadian continent, where so much land is forest and uninhabited, is a cause capable of some amelioration by the increase of population there; but the former is one which must remain unaltered, and, so far as it is concerned, Newfoundland must ever remain a cold country. It is a common assertion of people in the country that the climate is becoming less severe. This assertion seems unfounded. The winters of 1848-9, 1853-4, 1858-9, 1861-2, and 1862-3 were confessedly severe in the extreme, and the last two almost unprecedented. More provision is now made against the cold, the houses are better, and the clothing of the people more suitable than in former times; yet the rigour of climate seems to have been borne at least as well as it now is, and, indeed, fewer diseases were known then.

There are some beautiful phenomena peculiar to such a climate, which I hope it is not out of place to mention here.

The great frosts of winter cause so clear an atmosphere that the skies, both by day and night, appear in marvellous beauty. The Aurora is remarkable for its beauty and frequent appearance. It seemed to me far finer on the north-west side of Newfoundland than anywhere else. Its colour is usually yellow, sometimes variegated, not often a general red. A man whom I knew attributed the loss of sight in one of his eyes to the Aurora, the rays of which he said were playing quite low upon the water, while he was attending to the sails of his boat. A feeling of something like spider's web across his eye, which he tried to wipe away, was, he believes, the effect of a ray of the Aurora through which he passed, and from it blindness resulted. Whether this is credible or not I am unable to judge.

Mirage is a very usual appearance on the coast: so are very beautiful halos both of the sun and moon.

Scarcely any object in nature can be more strikingly beautiful than what is called "silver thaw," or "glitter;" and this is seen

many times in every winter. When rain or thick fog quickly follows a change to mild wind, the water falling upon surfaces which are yet frozen is at once congealed, and thus every object exposed to it becomes thickly coated as with glass. It can be imagined how magnificently brilliant the whole scene becomes when the weather clears and the sun shines; every minute branch upon a tree, almost every blade of grass, if there be any bare of snow, appears a distinct crystal. Once seen it cannot be forgotten.

Thunder-storms are frequent and violent. To my remembrance they seem often heavier than any I have known during 18 months' experience in the tropics. I have seen in Newfoundland the trees consumed by lightning on a mountain's sides, a house rent open, large timber cloven, clothes burnt, and iron fused, in a storm of peculiar violence in August, 1852. Such storms as this, however, are rare. Some of the heaviest I have known were in the winter season.

The atmosphere around the whole country seems to be at all times very greatly charged with electricity; but perhaps it is most so in winter. All fur, and the human hair, will discharge the electric fluid very audibly and visibly at every touch; and all woollen clothing, especially that worn next the person, makes a remarkable discharge whenever it is taken off the wearer.

As a consequence of the climate, rather than of any peculiar habits of life, the people, though very few of them are more remote from English parentage than the third generation, are in some particulars a distinct race. They are generally of short stature, attain maturity very early, and are remarkably prolific. They have wonderful power of enduring hardships; but disease, attributable more or less directly to their hard living, is lately becoming very prevalent among them. Consumption of the lungs, almost unknown when I first went there, has increased alarmingly in the past 12 years. Of 37 deaths in my congregation in one year, 14 were from this disease. Caries of the bone is another disease, cases of which are suprisingly numerous. Many of the people suffer from scurvy, especially those persons who for the winter season live and work in the forest above the coast. This, however, is not a new or increasing malady. Diseases of the heart are very common.

A broad belt of forest surrounds the island. The woods are of much finer growth, more various in kind, and much less despoiled by the axe and by fires on the western side and around White Bay, than those to the eastward. Fir, spruce, pine, and birch are in the greatest abundance; but there are also larch, aspen, balsam-poplar, mountain-ash, and alder. Some kinds of timber are becoming extinct in places where a few years ago they grew in plenty, in consequence of unsparing cutting for building purposes and for sale. Pine is thus becoming scarce; so is larch; and it is difficult

to get birch of any size larger than for firewood. Many thousands of fir-trees are destroyed annually by rinding. The rind is required to cover fish in the course of curing. I have seen far above the head of one of the bays a solitary spot of fine yellow deal, which seems to be the only remnant, to the eastward at least, of a once common timber-tree, and escapes the axe only because it is far from water, and therefore could not be got out without too great labour. All trees in Newfoundland are of rather stunted growth; but the timber is preferred to the larger and freer grown timber of the American continent, as being harder and more enduring. Attempts have been made to introduce the oak and the ivy, but under the utmost care the plants exist in dwarf size, only to show the impossibility of naturalising them. Several kinds of fruit grow wild, principally upon scrubby bushes and trailing plants on the heaths and swamps. A very good fruit is the one named bake-apple: this is yellow, round, about the size of a cherry, granulated like mulberry. One fruit only is produced by each plant; but they are in such number as to make the whole surface of the marshes yellow in their season. One other berry, equally plentiful upon the heaths, is vulgarly named blackberry, but has no relation to the black or bramble berry of England. These fruits are of great value, not only in the diet of the people, who use them largely, but also for the support of birds and other wild animals, which are killed for food and for their fur.

The severity of the climate, sterility of the soil, and difficulty of procuring and applying manure, are all serious hindrances to agriculture. Fish and kelp are almost the only manures obtainable, and these are very difficult of carriage where no roads exist and there are no horses and carts, which is the case in a great part of the country. Some Scotch settlers upon the Codroy Rivers have grown wheat with some success. Wheat is grown also on the inside lands near St. John's. Only the 13 weeks' grain can be sown, because no fall-sown seed can live through the frosts of winter. Cultivated as it is only upon land far above the sea-shore, the crop has often to be cut green. Barley is grown with more sure success in lands far up the bays; but that, also, in some years cannot be ripened. Turnips are a good and sure crop, and great quantities of potatoes are grown; but these are almost all of poor quality. For this, however, the land is not wholly to blame, for I have proved by repeated experiment, that with proper manure and care it will produce potatoes thoroughly good. Carrots, parsnips, a hardy kind of onion, and cabbage are successfully cultivated, and in the south peas may be grown. These are nearly all the esculent vegetables which the land has been proved capable of producing. Crab-apples, currants, especially the black sort, gooseberries, and damsons, are the only table-fruits; and of

these the first and last can be grown only in the south of Newfoundland.

Fur-bearing animals are numerous, and a great source of gain to some of the fishermen, who in winter turn furriers. Arctic foxes are here in all their variety; white, yellow, patch, silver-haired, and black-poles: the last-named the most precious. For good fox-skins, undressed, the furriers get from the merchant who exports them these prices:—white, 1*s.*; yellow, 5*s.*; patch, 40*s.*; silver, 120*s.*; black, 200*s.* Beavers, once nearly extirpated, are now becoming numerous, being unmolested because of the low value of their fur. Brown bears are pretty numerous, and valued both for meat and fur. White bears are sometimes found on the northern promontory of the island, where I imagine they are but visitors, having come to the shore upon the ice which drifts down in spring from the Arctic seas. Wolves were killed for a reward given by the Colonial Government, and became nearly extinct. In 1849 the reward ceased to be paid, and these animals are becoming again numerous and very troublesome. I know one poor man who has lately lost many sheep by them. A man in the Bay of Islands showed me, in 1849, the skins of three large wolves which he caught, out of a gang of six that had chased a deer from the interior country into his garden, and lurked about his house for some days afterwards. One of the six was black, the others were greyish white. Those caught measured six feet from the nose to the end of the tail. Deer are always in very great number in the interior, and sometimes they stray, solitary or in twos and threes, to the outside at any season of the year; but their general habit is to herd together in the northern parts of the interior during summer, and as soon as the snow has set in and buried the moors, flock down southwards through the woods, where only they can then find food. This brings them near the outside of the country and within reach of the people who waylay them on the shores of the lakes, and shoot them in the water. In those winters in which snow does not fall early, no deer come through the forests; but they travel southwards then on the inside. I regard this fact as a corroboration of the general report that the interior country is a great open plain. In such winters, the moors being free from snow, the deer have not occasion to enter the forest, and do not come to the outside. The skin of these animals is invariably spoiled in the slaughtering and wasted. Martens, hares, and ermine are very numerous, and otters and musk-rats are found in almost every pond and brook.

The only discovered relics of bygone times and former inhabitants of the land are of no great age. The remains of Red Indians have sometimes been found buried, not in any general cemetery, but in solitary graves. Five or six years ago such a discovery was

made close by the sea-shore in my mission. A large quantity of birch-tree rind had been used in place of a coffin. Within this wrapping only a few small remnants of bone were found ; but with them were arrow-heads, a knife, a clay-pipe, a saucer with red ochre, and a brush. These interesting relics were all lost and destroyed through the carelessness of the ignorant man who found them. Reckoning that from the Government or elsewhere he would get some fabulous price for the remains, he kept them in his own custody, but allowed them to be handled by his family and neighbours till they were crumbled and lost. In Bloody Bay and in Fresh-water Bay numerous relics of some former European settlers have been found ; but, unfortunately, no value was attached to them by the finders ; and they, also, are all lost. They were chiefly coins, knee and shoe buckles, pipes, and earthenware vessels. Of the coins I was told that they bore no other impression than “flowered-work.”
